

Space News Roundup

Vol. 33

April 15, 1994

No. 15

Goldin: 'Station on track'

By Kari Fluegel

NASA Administrator Daniel Goldin this week told the House's Subcommittee on Space that the agency is where it should be on the International Space Station.

"We have stuck with our plan, met our target dates and have just come through a tough-minded System Design Review with our international partners and contractors with flying colors," Goldin said during his testimony Wednesday. "The bottom line? The space station is right on track."

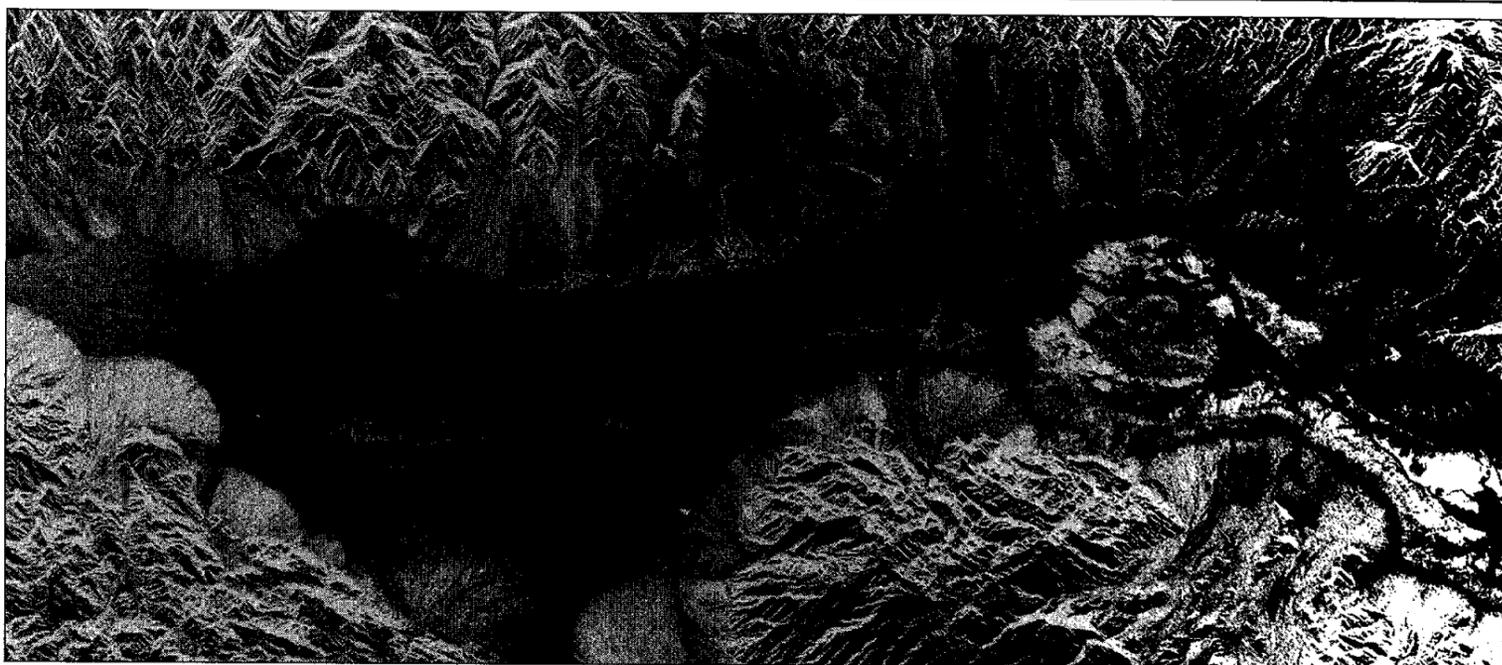
Goldin said the current International Space Station design received "rave reviews" from Charles M. Vest, chairman of the committee that reviewed the redesign effort last year.

"This program has been dramatically reorganized and has progressed to an extent that greatly exceeded my expectations," Goldin said, quoting a letter from Vest to Dr. John H. Gibbons, director of the Office of Science and Technology Policy.

Goldin added that the success of the redesign effort demonstrates NASA's credibility and commitment to the station.

"This is the station that has met the tough standards; this is the station the President submitted to Congress; and this is the station we are going to build. We took to heart Congressional concerns over the

Please see **GOLDIN**, Page 4



The Space Radar Laboratory recorded this image of Death Valley Monday. (The photo is oriented with north to the right and west at the top.) Using images such as this, researchers will be able to piece together how surfaces evolve and how climates have changed over time. Sights such as Death Valley will allow scientists to verify geological models that can then be applied to more remote sites.

Radar lab images surpassing expectations

By James Hartsfield

Images from the Space Radar Lab-1 instruments are already providing scientists with puzzles and surprises as the Earth-looking radar mounted in *Endeavour's* cargo bay makes its maiden flight.

At presstime Wednesday, both the orbiter and SRL were performing flawlessly, and all of the planned observation sites around the world had been observed at least once, with many more planned before landing next week.

Early on, scientists were ecstatic with an image of the Sahara desert in Egypt and Sudan, Africa, which

looked below the shifting sands to reveal an extensive network of ancient riverbeds.

"This far surpasses my expectations. It's just incredible," said Diane Evans, project scientist for the Spaceborne Imaging Radar-C. Evans said details about the Sahara's wet past may provide clues to the future climate, environment and geology of areas throughout our planet.

"Of major interest to us now is catching areas that are on the verge of going the same route," she explained. "We want to know in advance the areas that may in the

future not sustain human habitation. That's where this research is clearly headed."

The radar's observations have spanned the globe, including sites in Japan; the Pacific and Atlantic Oceans; California, Wyoming, Oklahoma, Michigan and North Carolina in the U.S.; the Amazon River basin in South America; and a host of others. In addition to the environmental and geological information provided by the SIR-C and X-Band Synthetic Aperture Radars aboard *Endeavour*, another instrument, called the Mapping of Air Pollution from Satellites, or MAPS,

had already charted the distribution of carbon monoxide in the atmosphere above almost half of Earth by the fourth day of the flight.

The crew—Commander Sid Gutierrez, Pilot Kevin Chilton, Payload Commander Linda Godwin on one 12-hour shift and Mission Specialists Jay Apt, Tom Jones and Rich Clifford on another—has been on duty 24 hours a day to provide photographs that supplement the radar information and maneuver *Endeavour* to assist with aiming the radar at its targets. Their work has not been interrupted by any

Please see **MISSION**, Page 4

Employees honored with NASA medals

More than 100 JSC employees will receive NASA's highest honorary awards during a special ceremony set for 3 p.m. April 22 in the Teague Auditorium.

The NASA Honor Awards ceremony recognizes individuals and groups at JSC nominated for service, leadership and achievement medals. Each medal recipient also will receive a certificate signed by the administrator.

Individuals selected to receive the NASA Group Achievement Award on behalf of their team will receive a framed certificate at the ceremony. Certificates for individual participants

of the teams will be forwarded to the nominating organizations at a later date.

Recipients are encouraged to invited family members and co-workers to attend the ceremony. Following the presentations, a reception will be held in the lobby of the auditorium.

Included in the awards is a special posthumous presentation to Mercury Astronaut Donald K. "Deke" Slayton. Slayton, who died June 13, 1993, will be honored with the NASA Distinguished Service Medal.

NASA Distinguished Service Medal will be presented to 10 astro-

nauts in a special ceremony Tuesday at NASA Headquarters. Medal recipients are John E. Blaha, Guion S. Bluford Jr., Richard O. Covey, Ronald J. Grabe, Jeffrey A. Hoffman, Shannon W. Lucid, F. Story Musgrave, Steven R. Nagel, Jerry L. Ross and David M. Walker.

At the April 22 ceremony, the NASA Outstanding Leadership Medal will be presented to Larry E. Bell, Jack C. Boykin, Kenneth D. Cameron, John H. Casper, Frank L. Culbertson Jr., David H. Finney, Charles S. Harlan, Eugene F. Kranz, David C. Leestma, G. David Low, Clay E. McCullough, John W.

O'Neill, M. Rhea Seddon, William M. Shepherd and James D. Wetherbee.

Leo G. Monford Jr. will receive the NASA Exceptional Engineering Achievement Medal.

The NASA Exceptional Service Medal will be presented to Kathleen M. Abotteen, Thomas D. Akers, John W. Allen, Brian L. Anderson, George D. Arndt, Bryan P. Austin, Jeffrey W. Bantle, William P. Bays, David G. Billingsley, Kenneth D. Bowersox, Michael A. Brieden, Melvin C. Buderer, Robert D. Cabana, Sharon B. Castle, Robert J. Cusick, Lynn M. Cross, Margaret E.

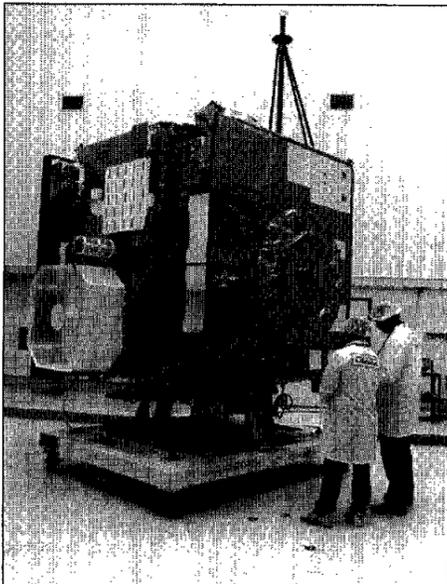
Please see **MEDALS**, Page 4

Buyout deadline expires today

Today is the final deadline for employees interested in participating in the Government-wide buyout program.

Those taking advantage of the buyout must submit an Application for Separation Incentive (Buyout) to the Employee Services Section, Bldg. 45, Rm. 140 by 5 p.m. today. All interested employees must complete and return the application to confirm separation date.

For more information, contact Human Resources at x36251 or a benefits specialist at x32681.



GOES-I gets checked out in KSC's processing facilities prior to being loaded on its Atlas-I booster.

New improved weather satellite GOES to orbit

By Kari Fluegel

Predicting weather will become a little easier once the latest generation of Geostationary Operational Environmental Satellites begins on-orbit operations.

The first of the new satellites, GOES-I, was launched on board its ATLAS-I booster from the Cape Canaveral Air Station at 1:04 a.m. Wednesday. After a flawless ascent, controllers fired the engines several times to begin transferring the satellite to its operating orbit. GOES-I will now coast for the next two weeks to its final position 22,300 miles above the equator over Ecuador.

GOES-I is the first in a series of five satellites that will be the eyes of weather forecasters into the next century. The satellite system is owned and operated by the National Oceanic and Atmospheric Administration, but in a cooperative arrangement, NASA manages the design, development and launch of the spacecraft.

"This spacecraft provides us with a lot of very, very important advantages," said Dr.

Elbert W. Friday Jr., NOAA's assistant administrator for weather services.

"This spacecraft will replace a fundamental geostationary weather observation capability that we must have to carry on our routine day-to-day mission in the National Weather Service. The second thing this will do is it will allow us to look with greater precision, greater accuracy and greater frequency than we have ever been able to observe weather from the geostationary advantage of space before."

Each satellite in the series carries two major instruments: an Imager and a Sounder. These instruments acquire high-resolution and infrared data, as well as temperature and moisture profiles of the atmosphere. They continuously transmit these data to ground terminals where the data are processed for rebroadcast to primary weather services in the United States and around the world.

The new GOES also will be stabilized on three-axis, a significant improvement from the older spinning spacecraft. With this stable design, the Sounder and Imager will stare at

the Earth continuously, giving GOES a new option of interleaving frequent pictures of small area events with minimal interference thus enabling GOES to produce more pictures during severe weather events.

GOES-I and GOES-J, set for launch next year, will watch over the western and eastern halves of the United States, its coastal waters, and the Pacific and Atlantic Ocean breeding grounds for winter storms and hurricanes.

Besides improving the overall quality of weather predictions, the new GOES satellites are expected to have significant benefits for the marine, agriculture and aviation communities. Weather forecasters will be able to scrutinize and analyze specific atmospheric conditions that cause low-level fog, thunderstorms, high winds and the waves they generate—elements posing threats to safe marine navigation; floods, thunderstorms, hurricanes and other severe weather conditions that adversely affect agriculture; and atmospheric conditions that can be dangerous to airplanes such as low clouds, clear air turbulence and icing.

JSC

Ticket Window

The following discount tickets are available for purchase in the Bldg. 11 Exchange Store from 10 a.m.-2 p.m. Monday-Thursday and 9 a.m.-3 p.m. Friday. For more information, call x35350 or x30990.

EAA NASA Picnic: The picnic will be held from 11 a.m.-5 p.m., May 7 at the Gilruth Center. Cost is \$5 adults, \$3 children. Ticket prices increase by \$1 after April 29 and no tickets will be sold after May 3.

Astroworld Early Bird: Tickets available for one-day admission for 1994 season. Cost is \$16.85 per person. Tickets must be purchased by May 31.

Seaworld of Texas: Discount tickets: adult \$20.95; child (3-11), \$14.25.

Fiesta Texas: Discount tickets: adult \$18.95; child (4-11) and seniors (55+), \$14.25.

Moody Gardens: Discount tickets for two of three different attractions: \$9.50.

Entertainment '94 Coupon Books: Bay Area/Galveston/Downtown or FM 1960/Downtown: \$30 each. Gold C Books: \$8.

Space Center Houston: Discount tickets: adult, \$7.95; child (3-11), \$4.75; commemorative, \$9.55.

Metro tickets: Passes, books and single tickets available.

Movie discounts: General Cinema, \$4.75; AMC Theater, \$4; Loew's Theater, \$4.50.

Stamps: Book of 20, \$5.80

JSC history: Suddenly, Tomorrow Came: A History of the Johnson Space Center, \$11.

The Exchange Store also is offering various Secretary's Day and Mother's Day items starting as low as \$12.50.

JSC

Gilruth Center News

Sign up policy — All classes and athletic activities are first come, first served. Sign up in person at the Gilruth Center and show a NASA badge or yellow EAA dependent badge. Classes tend to fill up two weeks in advance. Payment must be made in full, in exact change or by check, at the time of registration. No registration will be taken by telephone. For more information, call x30304.

EAA badges — Dependents and spouses may apply for photo identification badges from 6:30-9 p.m. Monday-Friday; 9-11 a.m., 1-3 p.m. and 6:30-9 p.m. Wednesdays; and 8 a.m.-4 p.m. Saturdays. Dependents must be between 16 and 23 years old.

Weight safety — Required course for employees wishing to use the weight room is offered from 8-9:30 p.m. April 21. Pre-registration is required. Cost is \$5.

Defensive driving — Course is offered from 8:15 a.m.-3 p.m. Saturday. Next class is May 14. Cost is \$19.

Scuba class — New class begins April 21. For additional information, contact Bernie Ehlers, 333-5364.

Aerobics — High/low-impact class meets from 5:15-6:15 p.m. Tuesdays and Thursdays. Cost is \$32 for eight weeks.

Exercise — Low-impact class meets from 5:15-6:15 p.m. Mondays and Wednesdays. Cost is \$24 for eight weeks.

Aikido — Martial arts class meets from 5-7:30 p.m. Tuesdays and 6:15-8:15 p.m. Wednesdays. Black Belt class from 6-8 p.m. Fridays, requires instructor permission. Cost is \$25 per month.

Sailing Club — A start-up meeting is planned for 5:15 p.m. April 15 at the Gilruth Center. Sailing lessons are planned for May and June. For information, contact.

Softball Tournament — The Spring Fling softball tournament will be played April 23-24. Deadline for team entry is 7 p.m. April 20. Cost is \$100 per team.

Intercenter run — The Spring Intercenter Run continues through April 30. Run or walk a two-mile or 10K course and submit times to the center.

Fitness program — Health Related Fitness Program includes a medical examination screening and a 12-week individually prescribed exercise program. For more information, call Larry Wier at x30301.

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JSC

Dates & Data

Today

Cafeteria menu — Special: tuna noodle casserole. Total Health: steamed salmon steak. Entrees: steamed salmon steak, roast beef, baked chicken, steamed fish, Reuben sandwich. Soup: seafood gumbo. Vegetables: French cut green beans, cauliflower with cheese, green peas, black-eyed peas.

Monday

Cafeteria menu — Special: breaded cutlet. Total Health: crispy baked chicken. Entrees: baked chicken, beef chop suey, smoked sausage and German potato salad, French dip sandwich. Soup: cream of broccoli. Vegetables: okra and tomatoes, peas, navy beans, baby carrots.

Tuesday

Cafeteria menu — Special: fried chicken. Total Health: vegetable lasagna. Entrees: Salisbury steak, steamed pollock, vegetable lasagna, French dip sandwich. Soup: split pea and ham. Vegetables: mixed vegetables, French cut green beans, pinto beans, vegetable sticks.

Wednesday

Astronomy seminar — The JSC Astronomy Seminar will meet at noon April 20 in Bldg. 31, Rm. 129. For more information, call Al Jackson, 333-7679.

Lunch meeting — The Materials, Structures and Dynamics Committee presents a lunch and learn seminar at 11:30 a.m. April 20 at Lockhead Plaza I. Steve King and Steve Solomon will discuss Space Mechanism Analysis using DADS. For

additional information, contact Gillian Parker, 333-6239.

Cafeteria menu — Special: stuffed bell pepper. Total Health: stuffed bell pepper with creole sauce. Entrees: fried catfish with hush puppies, stir-fry chicken and rice, wieners and beans, Reuben sandwich. Soup: seafood gumbo. Vegetables: buttered rice, Italian green beans, corn O'Brien, peas and carrots.

Thursday

SOLE meets — The Houston Chapter of the Society of Logistics Engineers will meet at 5:30 p.m. April 21 in Bldg. 30A. Richard McKeel of the Mission Operations Directorate will present "A Demonstration of the consolidated Maintenance, Inventory & Logistics Planning Subsystem." For reservations or information, contact Mike Goodall, x44674; Mike Elliott, x30244; Ken Zingrebe, x40085; Lee Graham, x40913; Richard Wolfe, x36863; or Dennis Wise, x33661.

Russian speakers — Practice Russian language skills from 11 a.m.-1 p.m. April 21 in the Bldg. 3 cafeteria. For more information, call Jack Bacon, x38725, or Amy Mendez, x38066.

Cafeteria menu — Special: barbecue smoked link. Total Health: roasted turkey breast. Entrees: turkey and dressing, beef stroganoff, chopped sirloin, French dip sandwich. Soup: tomato Florentine. Vegetables: Lima beans, buttered squash, Spanish rice, oriental vegetables.

Friday

Cafeteria menu — Special: meat sauce and spaghetti. Total Health:

spaghetti noodles with turkey meat sauce. Entrees: rainbow trout, liver and onions, been cannelloni, pork and shrimp egg roll, Reuben sandwich. Soup: seafood gumbo. Vegetables: steamed broccoli, breaded okra, cut corn, black-eyed peas.

April 27

Astronomy seminar — The JSC Astronomy Seminar will meet at noon April 27 in Bldg. 31, Rm. 129. For more information, call Al Jackson, 333-7679.

April 28

AIAA meets — The Houston Section of the American Institute of Aeronautics and Astronautics will meet at 5:30 p.m. April 28 at the Gilruth Center. Wayne Alexander of Southwestern Bell Telephone will discuss the "Information Super Highway: Southwestern Bell's Role." For reservations or information, contact Frankie Hap, 333-6064; Ardell Broussard, 283-1040; Mary Ann Bivona, 483-1350; or Sarah Leggio, 282-3160.

Russian speakers — Practice Russian language skills from 11 a.m.-1 p.m. April 28 in the Bldg. 3 cafeteria. For more information, call Jack Bacon, x38725, or Amy Mendez, x38066.

April 29

Bay Area Chorus — The Bay Area Chorus and the Tomball Community Chorus will present the Brahms Requiem, with orchestra at 8 p.m. April 29 in the Pasadena High School Auditorium. Discount tickets are available through the Exchange Store. For additional information, contact 684-6030.

Swap Shop

Swap Shop ads are accepted from current and retired NASA civil service employees and on-site contractor employees. Each ad must be submitted on a separate full-sized, revised JSC Form 1452. Deadline is 5 p.m. every Friday, two weeks before the desired date of publication. Ads may be run only once. Send ads to Roundup Swap Shop, Code AP3, or deliver them to the deposit box outside Rm. 147 in Bldg. 2. No phone or fax ads accepted.

Property

Lease: Nassau Bay townhouse, 4-2-2.5, 2000 sq ft, lg garage, deck, atrium, non-smoker. Jerry, x38922 or 488-5307.

Sale: Nassau Bay, house, 4-2-2, \$113,750. 333-3876.

Rent: Arkansas cottage, Blue Mt Lake, furn, 4 acres, \$250/wkly/\$50/dly. x33005 or 334-7531.

Rent: Galveston beach house, dly/wkly, CA/H, furn. Ed Shumilak, x37686 or 326-4795.

Sale: Galveston beach house, 3-2, CA/H, furn. Ed, x37686 or 326-4795.

Sale: Taylor Crest, 4-3-2.5D, 3200 sq ft pool/spa, balconies, art studio, \$282.5k. Richard, x30271 or 326-4963.

Rent: Galveston condo, furn, sleeps 6, Seawall Blvd and 61st St, dly/wknd/wkly. Magdi Yassa, 333-4760 or 486-0788.

Sale: 2.69 acres, Friendswood, city util avail, cleared for building. Howard, x37346.

Lease: Middlebrook home, 3-2-2, cath ceilings, jacuzzi, no pets/smokers, ref, \$1.1k/mo. 664-8838.

Sale: 10 acres in scenic Hill country. 925-8770.

Sale: Heritage Park, 3-2-2, covered deck, storage shed, remodeled, \$72k/neg. x40213 or 332-7092.

Sale: Marina townhome, 2-2, LC, \$99.5k. Steve Brody, 202-358-0889 or 703-532-3415.

Sale: Bay Forest patio home, 3-2-2, cul-de-sac, upgrades, \$150k. x33075.

Sale: Friendswood, 3-2-2, 2-story, \$73.5k. x37444.

Sale: Bay Glen, 3-2.5-2, loft, lg family room, sec system, \$114.9k. Mick, 283-0269 or 280-5034.

Sale: Waterview home, 2-story, appli, \$89.5. John Postell, 559-1574.

Sale/Lease: Bayfront Towers, Nassau Bay, 1 BDR, lux condo, \$74.5k/\$750/mo. 326-5584.

Sale: Baywind I condo, 2-1.5-2, W/D/DW, ex cond, \$35k. Tom, 333-3992.

Sale: Property, 1.9 acres, Point Blank, TX. William, x37310 or 326-2307.

Sale: Pearlland/Sunset Meadows, 2-story, 3-2.5-2A, 2650 sq ft, sec system, lg master bedroom, lg gameroom, \$117.9k. Diana, x37337 or 992-5064.

Cars & Trucks

'86 BMW 528E, sunroof, AM/FM, tape, \$6.5k. Charles, 426-2039

'89 Daytona, A/C, AM/FM, cruise, \$3475. Charles, 426-2039.

'82 Camaro, A/C, auto, 2.8L V6, AM/FM/

cass, brn/beige, ex cond, \$2.5k OBO. 991-5280.

'87 Honda Accord, 3 dr, 5 spd, A/C, AM/FM/cass, 59k mi, ex cond, \$4.5k. x32774 or 480-5232.

'85 Mercury Marquis Brougham, 85k mi, auto, A/C, \$2.5k. x35277 or 440-1659.

'89 Celica ST, 5 spd, A/C, PS, AM/FM/cass, sunroof, non-smoker, 72k mi, ex cond, \$6k firm. Julie, x38866 or 332-9270.

'89 Olds Calais, 3rd, PS/PB/A/C, AM/FM, Auto, BO. Kathy, 947-2025.

'81 VW Diesel Rabbit parts, 4 dr. Dennis, 992-5285.

'83 Mercury Cougar, clean. 335-8070.

'88 Chevy Suburban, Silverado pkg, low mi, ex cond, \$9.5k. 482-7546.

'88 Ford Bronco II, burgandy XL, 6 cyl 2.9 L, 2 WD, 5 spd, AM/FM/cass, A/C, 61k mi, \$5.5k OBO. Bob, 486-7687.

'70 VW Bug, Ex cond, \$1.6k. Rick, 332-3866.

'89 Ford Aerostar Minivan, Eddie Bauer, pwr, digital pkg, dual A/C, ex cond, \$9250. 980-7481.

'86 Nova, 4 dr, AM/FM/cass, 167k mi, \$1k. Dave, x45381.

'86 Mazda Cab plus P/U, A/C, AM/FM/cass, 5 spd, 90k mi, \$2.7k. 488-8588.

'87 Mazda 626 LX, 4 dr, A/C, AM/FM/cass, auto, 70k mi, cruise, sunroof, pwr drs/locks, \$4.7k. 488-8588.

'66 Olds Cutlass, V8, auto, A/C, 56k mi, \$3k. x35277 or 440-1659.

'72 240Z w/280 engine, dual carbs, \$3.3k. Russ, x45979 or 332-1769.

Speed writing

Adapter board provides speed, increased capabilities

By Eileen Hawley

Although the crew of STS-62 fell one orbit short of establishing a new shuttle endurance mark, a record of another sort was set during the 14-day U.S. Microgravity Payload flight.

On board *Columbia*, a payload manifested as DTO 679 was setting a speed record. The Ku-band Communications Adapter is a JSC-developed computer board that will allow computers and other payloads to send and receive a variety of files at increased speeds using familiar software programs and without customized shuttle interfaces currently required.

Installed in an IBM Thinkpad computer, the KCA system was busily sending and receiving data about 1500-2000 times faster than ever before. The interface board that enables the technology is the result of efforts by JSC engineers Brett Parrish and Steve Schadelbauer, and Lockheed engineer Glenn Brown.

"We're downlinking almost 2,000 times faster than the Portable Audio Data Modem is capable of," said Parrish. "In fact, the entire hard disk can be downloaded in about 10 minutes."

The KCA is not necessarily Ku-band unique, according to the three engineers who developed it. The system acquired its name because it was first used in a ground demonstration showcasing a Robotics Division attempt to control the shuttle's robot arm through satellite links said Schadelbauer.

"It's much faster than the S-band system we have because there's more band width available," said Schadelbauer. "But the real advantage we see is that this system is so generic, it can be used not just in a computer, but in payloads as well. The KCA works by providing a standard computer bus interface on one side of the board so that payloads don't have to get involved in the mysteries of shuttle communications."

The challenge for the KCA team now is to make customers aware of the availability and benefits of the system.

"We worked on shuttle for years and knew a lot of payloads had difficulty interfacing with the shuttle communications system," said Schadelbauer. "We were attempting to give them a more user friendly interface, something more understandable." Although the board was originally developed for Ku-band communications, it's uses are not restricted to that system.

The computer board is installed into a docking station attached to the Thinkpad computer. A cable connects the computer to the Ku-band communications services on a panel inside the orbiter's crew cabin. The ground station is located in Bldg. 30.

"What we did was make access to the entire Tracking and Data Relay Satellite System link for the astronauts and ground controllers a natural interface," said Parrish. "If they can use Windows and File Manager software, they can operate KCA."

Access to the system is imbedded in file manager. The pull-down menu includes a KCA option, even a help menu, in the event the operator forgets how the system works. The KCA system also has a self-help mechanism.

A status box display on the computer screen constantly indicates the health of the communications connections. By disconnecting the KCA cable from the shuttle interface and looping it back through the computer, the KCA can also perform a self-diagnosis dramatically shortening troubleshooting time by identifying where a possible failure is, or is not, located.

"We've tried to use our experience over the last decade and a half working communication issues and tried to put all that knowledge into this design," said Parrish.

The status screen verifies to both orbiting astronauts and ground controllers that there is a working uplink and downlink. The rule for astronauts using the KCA is two green lights on the status screen indicate a working uplink and downlink. They can then transfer one or more files. If there is a problem with the uplink or downlink connections, red lights replace the green ones. Transmitting files is as simple as clicking on the file or files and dragging them to a "send" box, from where they are automatically downlinked.

The engineers achieved their goal of providing a simple interface mechanism. However, that simple appearance masks an incredibly complex and sophisticated program that even knows how to deal with possible antenna outages during transmission. If a connection is broken during transmission, the system notes the percentage of the transmission that was complete, and then resumes transmitting from that point once the connection is reestablished.

The IBM Thinkpad computer and KCA board is the prime candidate to replace the existing laptop computers used during shuttle flights. According to Parrish, the project has received a great deal of support from the astronauts and the shuttle program.

"This project has been a lot of fun," said Parrish. "We've had a lot of support from people like John Young and Marsha Ivins as well as several other astronauts that have seen the project."

KCA appeared on the STS-62 manifest only 3 1/2 months prior to the flight, largely due to the efforts of Ivins. The team demonstrated the project to Ivins who

decided she wanted it to fly on STS-62, significantly focusing the team's efforts and speeding up the development schedule. The effort required a lot of voluntary overtime, according to Parrish, but the system "worked flawlessly" during the mission.

KCA was unstowed on flight day 1 and operated briefly on days 1 and 2, however when DC power was lost from the orbiter's Payload Data Interface Panel, operations were temporarily suspended since the KCA requires both uplink and downlink for successful operation. The team developed an emergency mode uplink capability that began on flight day 7. On flight day 13, an inflight maintenance procedure restored power to the PDIP and regular KCA transmissions resumed until the Ku-band antenna was stowed two hours later.

According to Parrish, the primary KCA activity on STS-62 was to "send up lots of files" more efficiently than ever before. Because the system processes information so quickly, it also allows the transmission of different types of files, such as video, television or multi-media files.

Using the KCA system, the STS-62 astronauts became the first crew ever to see images of their own launch while they were still on orbit. The crew also received a video greeting from their families. While the ability for astronauts and families to "see" one another during flights is a nice benefit of the technology, the engineers stress that there are some very practical applications for the program.

"The importance of that video application may be in inflight maintenance procedures," said Parrish. "For example, engineers on the ground could develop and demonstrate an inflight maintenance procedure and it could be uplinked to the astronauts so they could actually see how the repair is intended to work." Schadelbauer stressed that close-out photos also could be quickly uplinked to the crew to ensure that payloads in the cargo bay had not shifted during the ride to orbit.

Although the KCA was a relative latecomer to the flight, the demonstration of its capabilities quickly generated a large demand for its services.

"Flight Directors Chuck Shaw and Phil Engelauf were very supportive of our efforts," said Parrish "and they were helpful in generating additional data for us" as payload customers became aware of its capabilities. The KCA also was used to transfer an image of data collected by one of the USMP-2 payloads back to the crew.

Raw data gathered by the Space Shuttle Backscatter Ultraviolet instrument was made into a visual interpretation that reflected changes in the Earth's ozone and was uplinked to the crew.

"The crew normally never sees that data," said Schadelbauer, "and this was a nice way to show them the benefits of the research they were conducting. We couldn't have sent this type of image file before because it would have taken hours."

The engineers plan to highlight further KCA capabilities during its next DTO flight. Though not currently manifested, they hope to fly again this summer.

"We've got a lot of things planned for our next DTO flight," said Parrish. "We are working on incorporating CD-quality sound, perhaps real-time video conferencing, and we want to show that we can control a payload or video system real-time from Mission Control."

The use of CD-quality sound may improve understanding and clarity during inflight interviews. Also during the next DTO flight, the engineers hope to control an onboard videotape recorder from the ground.

"We're trying to make using the shuttle's recorder more like using the video recorder at home," said Parrish. The computer displays a graphic that looks like the control panel of a home VCR machine, accurate to the point that touching the 'play' button on the screen starts the tape.

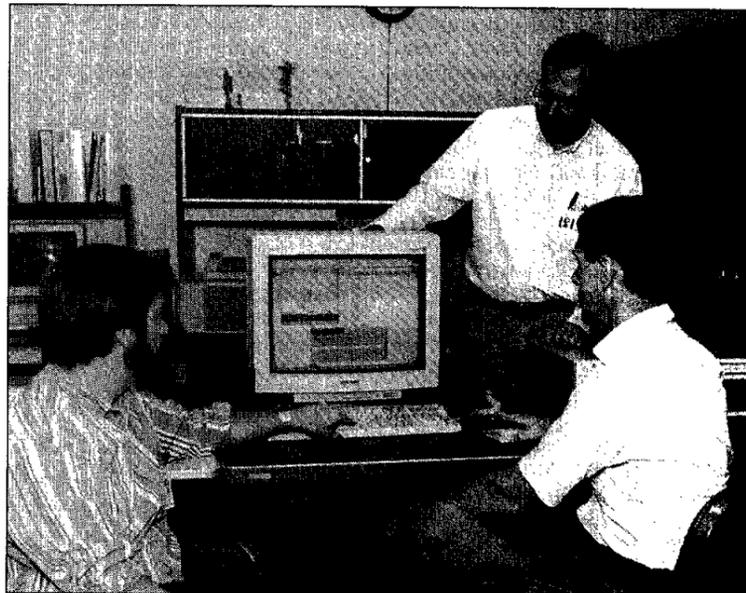
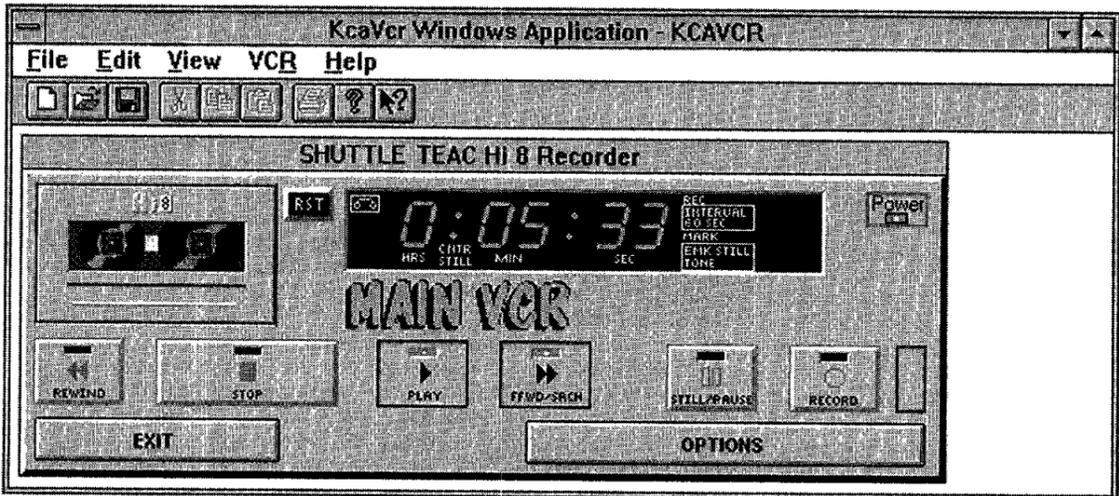
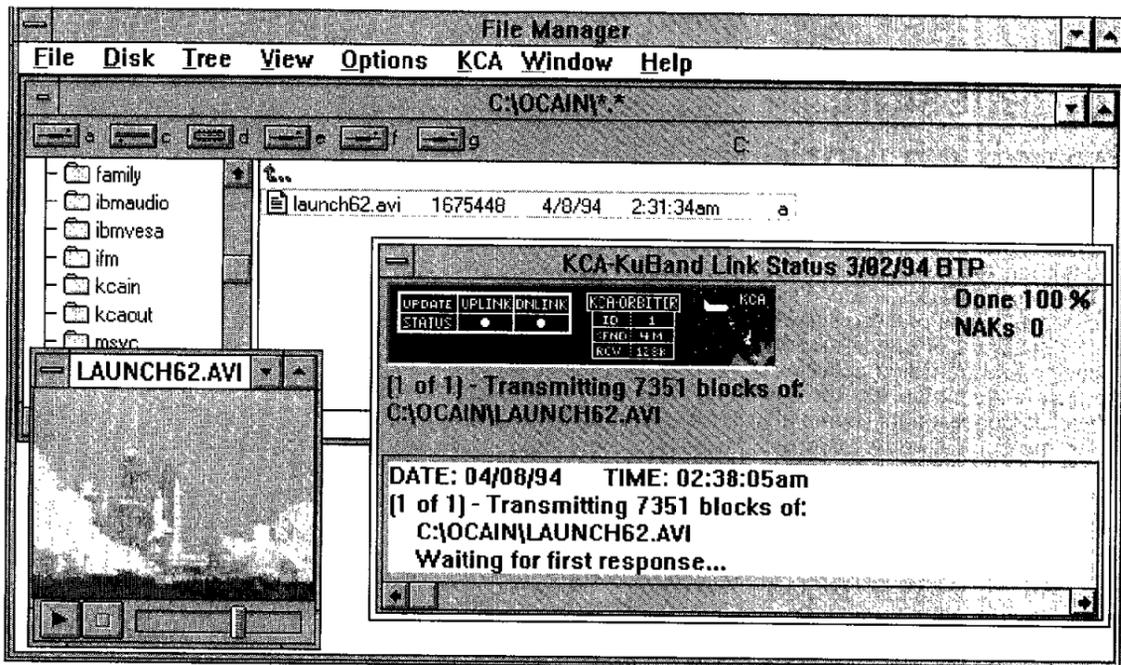
Despite being separated by 90,000 miles of communication satellite linkups, the tape recorder system should function like "the light switch at both ends of the hallway," according to Parrish. Control of the tape recorder can be accomplished simultaneously from both the ground engineers and orbiting shuttle crew by the flip, or touch, of a switch.

The three engineers also are considering the use of a small "lipstick" camera mounted to the top of the Thinkpad computer as a way to conduct live teleconferencing while on orbit.

"For instance," said Parrish, "with a computer-mounted camera and a 'doodle pad' to the side of the screen, the orbiting astronaut and ground controllers could exchange data and make notations on uplinked drawings or images in real time. Any payload customer or experimenter who wants to send data to the ground or get data from the ground has uses for real-time data."

The real time video capability also has potential applications for long-duration spaceflights, allowing the astronauts and families to send and receive personal video messages.

The total KCA data transmission time during STS-62 was just under 86 minutes. During that time more than 106 Megabytes of data were successfully transferred between the orbiter and the ground station. The equivalent time to transmit the same amount of information using the PADM system is about six days. □



JSC Photo by Bob Walck

Top: The KCA computer shows the live-action image of the STS-62 launch that was uplinked to the crew. Below: Ground controllers and astronauts may soon use a touch screen to control the video recorder on board the shuttle. Right: Brett Parrish, Steve Schadelbauer and Glenn Brown demonstrate the KCA capabilities.

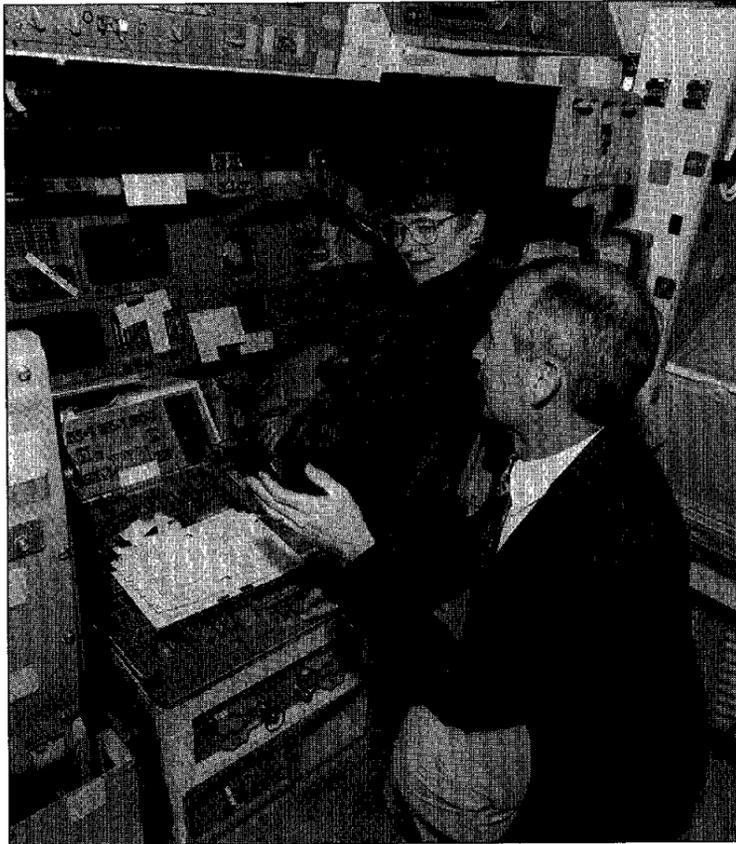
Forty honored for redesign, transition work

Forty JSC employees were honored at an awards ceremony held March 31 in Teague Auditorium.

The ceremony acknowledged the exceptional efforts of these individuals in support of space station redesign and transition activities. Associate Administrator for the Office of Space Flight Jeremiah Pearson and Deputy Center Director George Abbey presented the honorees with Superior Accomplishment Awards.

Recipients were John Aaron, Brant Adams, Donna Blackshear-Reynolds, Paul Boldon, Michele Burch, Jack Bullman, Cathy Claunch, Doug Cooke, Jim Costello, Doug Drewry, Brian Duffy, Chiold Epp, Dean Hanks, Lauri Hansen, Greg Hayes, Maurice Kennedy, Lois Lenox and Tom Mancuso.

Also receiving awards were Dave Mobley, Kornei Nagy, Deb Neubek, Lisa Price, Bill Reeves, Keith Reiley, Natalie Saiz, Bill Shepherd, Linda Shirley, Jenny Stein, Craig Stencil, Dan Swint, Harold Taylor, Dale Thomas, Sharon Thomas, Jim VanLaak, Brenda Ward, Jim Wetherbee, Dennis Webb, Ginny Whitelaw, Debbie Williams, and Walt Wood.



JSC photo by Mark Sowa

WASHINGTON VISITOR — Dr. Marcy Greenwood, the White House's Associate Director for the Office of Science and Technology Policy, visited JSC last week. Besides meeting with JSC Director Dr. Carolyn Huntoon, Greenwood toured center facilities including the Mission Control Center, the space station mock-up and several medical and Earth science laboratories. Above, Astronaut Brian Duffy gives Greenwood a pilot's-eye-view of the shuttle mock-up.

Endeavour tests new tough tiles

A new thermal protection tile developed at NASA's Ames Research Center, Mountain View, Calif., for the space shuttle may prove more efficient and less costly than tiles currently being used.

The new tile is known as Toughened Uni-Piece Fibrous Insulation. A low-density composite thermal insulation, it will undergo its first flight test on STS-59.

Several TUFIs tiles have been placed on the Space Shuttle *Endeavour's* base heat shield, between the three main engines. NASA and Rockwell International technicians will look at how well TUFIs resist impact damage.

If all goes as planned, there will be "significantly less" damage, said Dr. Daniel Leiser of Ames' Thermal Protection Materials Branch. TUFIs is an advanced version of the material that protects the space shuttle from the intense heat that builds up as the shuttle orbiter re-enters Earth's atmosphere.

"TUFIs has several times the damage resistance of the standard system," Leiser said. "Based on successful flight tests, the use of TUFIs may lead to a significant reduction in the labor costs of refurbishment."

Leiser said NASA officials are

looking for a tile material that "can reduce the repair time required between flights." TUFIs represents "quite an improvement" over the current thermal protection tiles, he said.

TUFIs is the first of a new type of composites known as "functional gradient materials." In these composites, the density of the material varies from high at the outer surfaces to low in the interior insulation. It "represents a whole different way of making these materials," Leiser said.

The current tiles are a rigid glass fiber composite and are about 93 percent air, with a thin glass coating that sits on top. The reaction-cured glass coating is physically much like window glass and is only about 12/1000ths of an inch thick.

"The problem with an RCG-coated tile is that the coating gets little support from the underlying tile," Leiser said. "So when it gets hit with a rock or something, it cracks or chips."

Unlike RCG, TUFIs permeates the pores nearer the surface of the insulation material. This supports and reinforces the outer surface, which makes the surface material less subject to impact damage. The outside has a relatively high density, with an increasingly lower density

within the insulation.

Since TUFIs is porous, the pores actually stop cracks from spreading. When an RCG-coated tile is hit, a crack spreads from the impact site much like what happens to window glass.

If a TUFIs-coated tile is hit, however, the damage is much more limited. The result is a small dent where the tile was hit. Since the damage is limited, the tiles are easier to patch.

TUFIs has been certified for six shuttle flights on all four orbiters.

"I'm convinced it's going to work very well," Leiser said. "We've got a lot of data that says this material will work extremely well."

If the tests are successful, Leiser said TUFIs may be used to replace tiles in specific, limited areas of the orbiter susceptible to significant impact damage. These might include the base heat shield between the engines, near the landing gear doors and near the thrusters used for orbital maneuvering.

Ames' thermal protection team also has developed several other improved thermal protection materials for the space shuttle. Among them is the flexible ceramic thermal protection "quilt" that covers the top of the shuttle.

Health program sponsors new weight control class

JSC's Total Health Program is initiating a new campaign to help JSC employees lose weight and develop and maintain healthy dietary habits.

"Maintaining a healthy weight profile has more to do with the level of our physical activity than with dieting," said Larry Wier, program coordinator. But, according to Wier, most Americans choose dieting over exercise as the way to lose weight.

Diets are extremely popular in the U.S., but they have not stemmed the weight-gain trend evidenced by the general population. Closer to home, a recent analysis shows that about 50 percent of JSC employees exceed ideal weight levels.

To help JSC employees, contractors and their families win the fight against those excess pounds, Total Health is beginning its "Complete Weight Control" classes May 4.

The program will educate and motivate participants to follow the sound exercise and nutritional practices that in turn lead to achieving and maintaining a healthy weight level. It will be taught by a team comprised of an exercise scientist, a licensed dietitian, a licensed social

worker and a physician.

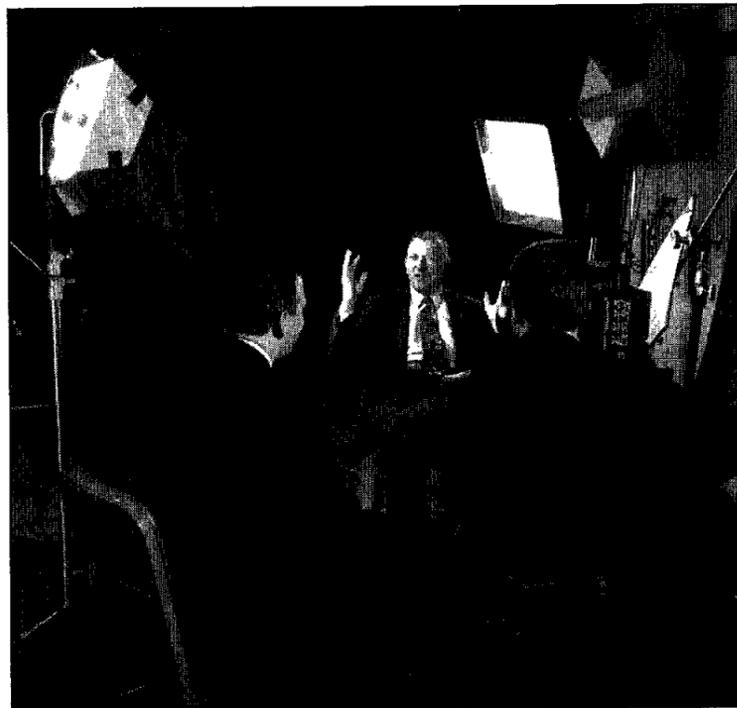
"Appropriate exercise and good health simply are not possible without good nutrition," Wier said. "We plan to address the holistic concerns of weight control with this program."

The first 12-week session begins May 4. Classes will meet from 11:30 a.m.-noon Wednesdays in the Gilruth Center. A second session begins August 3.

Participants will receive a scientifically-recommended healthy body weight goal at the beginning of the course, and will spend each class learning to use exercise, diet, and behavioral change techniques to achieve and retain the goals over the long term.

Complete Weight Control staff members will share responsibilities for course instruction on a rotating basis. Topics to be discussed during the classes include the medical aspects of being overweight and the dangers of rapid weight loss.

Applications for the Complete Weight Control Program have been distributed throughout the site and are being accepted on a first-come basis. For additional information, contact Wier at x30301.



REMEMBERING THE PAST — Recently retired Director of Mission Operations Eugene Kranz, center, returned to JSC to participate in the taping of a video tracing the history of the directorate. The video will be used in new employee orientations and also will be shown at the Lone Star Aviation Museum in Galveston.

Goldin discusses station

(Continued from Page 1)

station's cost and the President's call for better science with a cheaper price tag and we delivered."

Goldin also answered critics who believe canceling the International Space Station program would free money for other scientific efforts, an expectation that was voiced, but never materialized, when the super-

collider project was canceled last year.

"Canceling the space station will not make way for other scientific ventures," he said. "What it will do is say 'no' to a priceless opportunity to equip America for the 21st century with what may turn out to be humanity's greatest resource—the benefits and riches of space."

SRL providing unique Earth views

(Continued from Page 1)

mechanical problems of significance aboard *Endeavour*.

Endeavour was delayed a day in reaching orbit, however, as bad weather at KSC forced shuttle managers to scrub the launch on the first attempt April 8. But *Endeavour* reached orbit right on time a day later on Saturday morning. *Endeavour* has enough supplies to extend the nine-day planned mission by one day for additional radar observations, and shuttle managers have said that if all continues to go smoothly *Endeavour* will aim for a landing in Florida at about 10:53 a.m. central Tuesday.

On the third day of the flight, Pilot Kevin Chilton took time out from his duties to answer questions from

viewers of the C-SPAN television network.

Chilton said *Endeavour* is watching areas ranging from deserts to rain forests. "We are looking ... at the central latitudes, the rain forest areas, throughout the Earth, in Asia, Africa and South America," he told a California viewer.

"An interesting thing that the radar does for you in monitoring that area of the world is that when we fly over it and look out the window visually, we see lots of clouds. So we can't really report on the rain forest with optical sensors like a camera," Chilton explained. "But we've heard from the ground already that they have seen good tracks and coverage in that area with the radar."

Medals recognize service, achievement

(Continued from Page 1)

Davis, Sharon A. Delp, Jeff E. DeTroye, Brian Duffy, C. Michael Foale, Carlos R. Fontanot, Richard W. Fox, Richard E. Hall, Gregory J. Harbaugh, Terence T. Henricks, James A. Hickmon, Karen E. Jackson, Elizabeth M. Kalla, Donna J. Mays, Donald R. McMonagle, James D. Milhoan, Katherine E. Newkirk, Claude Nicollier, Gregory T. Oliver, Nanci A. Olson, Stephen S. Oswald, Carlos G. Parra, Larry P. Ratcliff, William F. Readdy, Anna K. Rogers, Mario Runco Jr., Howard J. Schneider, Kathryn C. Thornton, Ricardo J. Villarreal, Robert T. Voigt and James S. Voss.

Those receiving the NASA Exceptional Achievement Medal will be William R. Acres, Manuel Avila Jr., Donna M. Blackshear-Reynolds, John M. Brennan Jr., Mable L. Cobbs, Douglas R. Cooke, Pamela S. Denkins, Bonnie J. Dunbar, Ronald H. Gerlach, Gerald D. Griffith, Rosie S. Hernandez, Laura E. Hood, Andrew J. Mitchell, Robert A. Navias, Cuong Q. Nguyen, Henry O. Pohl, Nancy G. Robertson,

Natalie V. Saiz, Valerie D. Sias, Edith C. Taylor, Chester A. Vaughan and Brenda L. Ward.

NASA Public Service Medals will go to George P. Durney, ILC Dover (Retired); Joseph W. Hammond, Rockwell Space Operations Company; L. Daniel Inners, KRUG Life Sciences; Alan W. Nordheim, Martin Marietta; J. David Schweikle, McDonnell Douglas; Erlinda L. Stevenson, Rockwell Space Operations Company; Vladimir A. Timchenko, NPO Energia; John Tribe, Rockwell International; and Robert M. Webb, Murray and Associates.

Twelve individuals will receive NASA Certificates of Appreciation. They are Denise L. Baisden, Susan N. Brand, J. Travis Brown, Wayne A. Eaton, Robert L. Giesecke, Helen W. Lane, William T. Norfleet, William W. Seitz, Fred R. Spross, Earl W. Tiedt, Lewis C. Wade and Richard T. Walter.

NASA Group Achievement Awards will be presented to the Ascent Wing Aerodynamic Load Verification Team; Ascent/Entry

Trainer Project Team; Astronaut Office Mailroom and Special Activities Office; Automated Robotic Maintenance of Space Station Test Bed Team; CMAM Program Implantation Team; Commit-to-Flight Development Team; and Descent Aborts Team.

Also, the FY93 Congressional Budget Adjustment Proposal Evaluation Team; Mission Update Team; NASA/Baylor Left Ventricle Assist Device Team; Operations Phase Assessment Team; Orbiter/ Mir Docking Evaluation and Negotiation Team; Plasma Motor Generator Recovery Team; Scientific and Technical Information Management Team; Shuttle Training Aircraft Flight Software Development Team; Space Shuttle EMU Life Extension Test Team; Space Station Redesign Reliability Analysis Team; Spacelab Life Sciences-1 and 2 Mission Science Management Team; SLS-2 JSC Payload Project Team; SLS-2 JSC Metabolic Experiments Team; SLS-2 Mission Management Team; and the Transportation Mission Support Team.